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To SSD or Not to SSD? – That is the question.

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Whether ‘tis Nobler in the mind to suffer the Slings and Arrows and stay with Hard Drives, Or to take arms against a sea of troubles and Convert to a Newer Technology (Solid State Drives). Well, maybe that’s not quite what Shakespeare had in mind, but it does bring up the question. Should we begin to move to Solid State Drives in our computing devices? (Are we starting to see a replacement for the traditional mechanical Hard Drive?) Mechanical Hard Drives have been around since the beginning of Personal Computers. The IBM PC XT in 1983 included an internal 10MB (yes, that’s Megabyte) hard disk drive. Anyone remember the name “Winchester Drive”? The term Winchester actually comes from an early type of disk drive developed by IBM that had 30MB of fixed storage and 30MB of removable storage, so the inventors labeled it a Winchester disk, after the Winchester 30/30 rifle, but I digress.

The question is shall we upgrade to SSDs? And I think the answer is “yes”, where it makes sense. So, let’s look at where it might make sense. Consider that our computing devices fall into the following categories; desktops, laptops, tablets, and smartphones. Right off the bat, tablets and smartphones only come with solid state memory, so there is no decision to be made there. So that leaves desktops and laptops for our consideration. Though the number of desktops and laptops are expected to drop over the next few years, many of us will have at least a laptop for the foreseeable future. (A forecast made by International Data Corporation, a provider of market intelligence for information technology markets, indicates that around 85% of the Worldwide Connected devices by 2017 will be Smartphones and Tablets. For the other 15%, Laptops will outnumber Desktops by about 2 to 1.)

So, let’s look at why we might want to upgrade to an SSD in the first place. An SSD is a replacement for a traditional, mechanical disk drive. An SSD is a mass data storage device that uses solid-state memory to store non-volatile data for future access, in the same manner as a traditional hard disk drive. Traditional hard drives are electromechanical devices that employ spinning disks coated with magnetic material, and moveable read/write heads which “fly” over the disk at a height of less than 1 millionth of an inch. (A human hair is approximately 2,000 millionths of an inch.) In contrast, SSDs use microchips which retain data in non-volatile memory chips and contain no moving parts. SSDs allow for easy replacement because they are manufactured in the same physical form factor, and use the same electronic interface, as traditional hard drives. SSDs are typically more reliable, they are less susceptible to physical shock, and with no moving parts they are silent. But it is the fact that SSDs store and retrieve data faster than traditional hard drives that make them a desirable

upgrade. On the down side, SSDs are more expensive and typically support a limited number of writes over the life of the device, which is probably only a consideration for a super power user.

So, let's consider the question of upgrading a laptop or a desktop. Two common reasons for upgrading either of these might be lower cost or some type of improved performance. Today, for larger SSDs, lower cost is not in the cards. In fact, currently, large SSDs (say 1TB) are about four to five times as expensive as the equivalent hard drive. A large 1TB traditional hard drive would currently be about $75 and a 1TB SSD would be about $400. However, for smaller drives (say 100GB) the cost difference is much less. A small SSD might cost only around $50 but here a comparison is difficult because traditional hard drives only start at around 500GB. So on the low end, the SSD begins to be cost competitive. (Keep this in mind when we look at the desktop upgrade.)

So with cost not an advantage, then the reason would have to be improved performance, and in fact this is where the SSD really shines. A PC with an SSD will boot in tens of seconds, definitely less than a minute. The same PC with a hard drive will take much more time to boot and will be slower during typical use. So, the PC with an SSD will boot faster, launch applications faster and will generally exhibit faster overall performance. A minor side benefit with the SSD is that there is no need for de-fragmentation; because of the way the data is stored, the effects of fragmentation are negligible. (In fact you should never defragment an SSD because the defragment activity will lower the number of writes available.)

Now that we know that the main benefit of an SSD will be increased speed, and to a lesser degree increased reliability (remember no moving parts), what else should we consider. First, let's look at a laptop upgrade. Most laptops have space for only one drive, so we should probably put in a drive large enough for the laptop's intended uses. With only one drive, the Operating System and Applications and Data all have to share that one drive. The OS and Applications could take 80 to 100 GB, so a 256 GB drive might be the smallest to consider. Currently, 256GB drives can be had for somewhere in the $100 to $150 range. For someone with large music, picture, and/or video collections, a drive closer to 1 TB may be in order. Currently, 1TB drives can be had for somewhere in the $350 to $550 range. It is always good to have more space, but with the price premium of SSDs it may pay to buy only what you think you will need. 512 GB may be enough for most users. Currently, 512 GB drives can be had for somewhere in the $250 range. If this cost is no problem, then the laptop upgrade probably makes sense.

Finally let's consider a desktop upgrade. (I bet the audience for this upgrade is a whole lot smaller than for the laptop, but let us press on.) The nice thing about the desktop is that there is usually space for multiple drives. Two, three, or four spaces are not unusual. In this arrangement, the C: drive can be separated from the other drives. This allows the C: drive to be only as big as needed for the OS and Applications (data can go on the other drives). Maybe 120 GB is all that is needed, so this upgrade may be less than $100. The other drives can still be traditional hard drives. With this mix of SSD

and mechanical drives, the boot speed and the general operation will definitely be improved. (Although some data intensive operations where the mechanical drives are being used a lot may not show as much of a speed improvement.) This is a really inexpensive upgrade and it affords a lot of bang for the buck, so it, too, probably makes sense.